Chapter 5

Work-based learning: Why? How?

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1 Introduction

It is a fascinating exercise, for those who work in the education industry, to sit down with a group of workers – any group of workers – and ask them to list, first, the most important or useful knowledge and skills they use at work, and second, where they learned them. Almost without exception one of the most frequent answers to the second question will be at work, rather than in an educational institution. Of course in answering this question many people forget that the basic skills of literacy and numeracy that are the foundations for later formal learning, and the foundations of much that is learned at work, were acquired largely in the classroom. But even so, the regularity of this finding is a good reason for being cautious about any tendency to equate knowledge, skill and competence with formal education, or to regard educational qualifications as an adequate signal of knowledge, skill and competence. It is an exercise that gives you a healthy respect for the workplace as a venue for the acquisition of powerful knowledge and skill.

The first part of this paper looks at some reasons for believing that work-based learning matters, at some of the reasons that it seems a good idea to try to encourage it, and at some of its benefits for individuals, enterprises and governments. The second part of the paper looks at some of the more practical issues that arise when we try to encourage work-based learning. Do countries need to be wealthy in order to have well-organized work-based learning systems? How can this learning be stimulated? What approaches to it are useful? How can its quality be ensured? Should it be linked to the formal education and training system, and if so how? And what are some of the particular challenges that arise in trying to extend and improve it in developing economies? The paper's approach is largely practical, evidence-based and policy-focused. The theory of work-based learning, on which there is a very large literature, is not a major focus.

2 Why work-based learning matters

Work-based learning is a subset of experience-based learning. However within the somewhat narrower confines of vocational education and training, work-based learning refers to learning that occurs through undertaking real work, through the production of real goods and services, whether this work is paid or unpaid. It should be clearly distinguished from learning that takes place in enterprise-based training workshops and training classrooms. The latter, which can be referred to as enterprise-based training, is not work-based learning, but simply classroom-based learning that takes place in an enterprise rather than in an educational institution.[1]

The case for work-based learning is commonly made in terms of the benefits that it can provide for vocational education and training. However before this paper looks at the link between vocational education and training and work-based learning, four other arguments for it are discussed: its contribution to enterprise productivity and innovation; its value as a form of learning, regardless of its links to vocational education and training; its value in improving youth transitions; and its importance in career development. The evidence for these arguments is not only interesting in its own right, but highly relevant to questions about the relationship between work-based learning and vocational education and training.

2.1 Work-based learning can raise enterprise productivity and innovation

An important starting point in looking at work-based learning is the contribution that it can make to the productivity of firms and to innovation in enterprises. The internal organization of firms, the structure and organization of work, employee relations and wage structures can all interact to promote learning-rich work, and

1 Simulated work environments such as the training firms that are an integral part of vocational education for commercial and business occupations in Austrian vocational schools and colleges (Tritscher-Archan, 2009) are a borderline case between the two. Similar arrangements are also common in the Slovak Republic: see the Slovak Centre for Training Firms, www.siov.sk/slovenske-centrum-cvicnych-firiem/9429s

hence to raise productivity and innovation. Much of the literature on this topic comes from studies of Japanese corporations, and has little if anything to do with formal vocational education and training. For example Sako (1994) and Dore and Sako (1998) shows that a reliance on on-the-job training, small-group quality circles, in-house training courses and internal promotion are central to the productivity of Japanese corporations, as these are seen as the only way to cultivate and retain workers capable of enhancing plant-wide performance.

Itoh (1994) shows that incentive structures, pay structures and methods of work organization within Japanese corporations interact in a way that is designed to promote firm-specific human capital and to promote the acquisition and retention within the enterprise of productive knowledge. Itoh points out that long-term employment relationships are more prevalent in Japanese enterprises than elsewhere; wages rise at regular intervals to reflect the acquisition of skills and are not attached to particular jobs; Japanese workers tend to experience a wider range of closely related jobs than do those in a Western firm; job demarcation is more ambiguous and fluid; and more effective responsibility is delegated to the lower tiers of the organizational hierarchy. A wide range of studies show that learning-rich work can be cultivated deliberately through the use by firms of techniques such job rotation, task variety, task breadth, mentoring, and supervision by experts (see for example Eliasson and Ryan, 1987; Koike, 1986, 2002). This is supported by a research tradition which shows the ways in which learning-rich work environments can contribute to innovation within enterprises (Deitmer, 2011; Toner, 2011).

The Japanese approach to the relationship between work-based learning and enterprise productivity has little to do with formal vocational education and training. On the other hand the German dual system of apprenticeship is a major element of that country's formal vocational education and training system, and learning within the enterprise is an integral and essential element of it. An important group of studies conducted by the UK-based National Institute of Economic and Social Research (NIESR) during the 1980s showed that some of the distinctive features of the German dual system, and of German firms' approach to learning and skill development within the workplace, helped to explain the higher productivity of German firms compared with closely matched English firms in industries such as metal working, hospitality, retailing and construction. The NIESR studies not only showed that there is a link

between the level of skill development within German apprenticeships and enterprise productivity, but also that the breadth and quality of the skills plays a central role in enterprise productivity through influencing the ways in which work is able to be organized, compared with firms with a lower and narrower skills base.

The nature of the skills in German firms was shown to result in workers being able to operate with greater autonomy and less supervision than in comparable English firms, in workers taking greater responsibility for the quality of their work, and in labour being able to be used more flexibly. For example more broadly trained German hotel workers were able to be used for front-of-house tasks, food service, food preparation and room service, whereas English hotel workers with a narrower range of skills could not be deployed as flexibly, thus leading to a higher cost structure in English hotels (Prais et al., 1989).

Similar messages emerged from studies of semi-skilled workers who were not products of the dual system, but whose skills had been developed within the enterprise. For example the greater attention to quality among German workers in metal-working plants resulted in their cleaning their machines more frequently, thus reducing breakdown rates (Daly et al., 1985). In wood furniture manufacturing, regarded at the time as a relatively low-skilled industry in England, the superior skills of German production workers that had been developed through learning in the workplace enabled more sophisticated automated machinery to be used, allowed smaller production runs with more frequent machine resetting and thus lower inventory levels and more customized production, and resulted in fewer breakdowns (Steedman and Wagner, 1987).

2.2 Work-based learning is a powerful form of pedagogy

Work-based learning is a form of experiential learning, along with learning from experience in other settings such as the home, the community or recreational pursuits. The basic principles of experiential learning set out by Dewey (1938) infuse not only work-based learning, but also areas such as adult learning, service learning[2] and outdoor education (Billet, 2001; Boud et al., 1985; Dehnbostel, 2008a, 2008b;

2 See, for example: Service Learning Australia, www.servicelearning.org.au/, National Service Learning Clearinghouse, www.servicelearning.org/

McCulloch et al., 2010; OECD-KRIVET, 2004). For Dewey, learning was primarily an activity that arises from the personal experience of grappling with a problem (and thus not all experience results in learning, a conclusion which, as we shall see below, has implications for the development of practical techniques to improve the quality of work-based learning within vocational education and training). His view of learning contrasted with the practice of the time of students passively receiving information that has been packaged by teachers or in textbooks. He argued against the isolation of the school (and by implication other educational institutions) from the world outside it, and argued that the incorporation of students' experience and learning outside of the school was a powerful way to motivate them and to engage them in learning.

Work-based learning is used in vocational education and training to develop basic work habits, occupational identity, and specific occupational competences. However because of its attractiveness as a powerful form of learning, it can also be used for a wider range of educational purposes. For example it is used as a way to motivate disadvantaged, disengaged and failing students by giving them the opportunity to experience success through applied learning in practical settings, and the opportunity to come in contact with adult mentors and role models (Business-School Connections Roundtable, 2011). Work-based learning can be used in general education to develop problem-solving skills and learning skills: for example through allowing learning to be organized around joint accomplishment of tasks, so that elements of a skill take on meaning in the context of the whole, and by allowing competence to build step by step (Ainley, 1996; Resnick, 1987). Finnish research (Lasonen, 2005) has shown that it can teach entrepreneurship, promote maturity, and help to develop generic skills such as initiative and problem-solving. It can be used as a way of improving basic literacy and numeracy by helping students to understand the real-world application of basic skills (PhillipsKPA, 2010): in Denmark's vocational education system students learn theory, such as mathematical rules, through solving practical workplace tasks (Aarkrog, 2008–09). It can be used to teach higher-order cognitive skills in disciplines such as physics, for example in the industrial high school located in the Asea-Brown-Boveri factory in Västerås in Sweden (Sweet, 1995).

In Hong Kong's senior secondary school system, applied learning that allows students to gain real-life workplace experience is one of eight key learning areas[3], and is compulsory for all students. The rationale for this is that applied, contextual learning from real workplace experience is a fundamental method of helping students to develop learning skills, and that learning these skills occurs best through real-life experiences that have actual effects (OECD, 2011, p. 102). Work-based learning is not confined to secondary and vocational education, but is widely used in higher education for the teaching of complex knowledge and skills: for example it is widely used in medical education (Swanwick, 2010).[4]

2.3 Work-based learning can improve individuals' career development

The career development literature shows that experience of and in work can be a valuable way for young people to sharpen and clarify their career plans. Good career education programmes incorporate systematic experience of and learning from work, using techniques such as work shadowing, research projects about the nature of work, work visits, and carrying out real work tasks. The benefits of this type of work-based learning for career decision-making are amplified when participants have the opportunity to reflect on their experience and share it with others (Guile and Griffiths, 2001; OECD, 2004; Watts, 1996), a finding that parallels lessons about effective work-based learning that can be found in the vocational education literature.

The literature also shows that, for existing employees, work that is learning-rich benefits their career development. A recent study (Brown et al., 2010) shows that:

- People in learning-rich work environments are more likely to be positively disposed towards learning and to take a positive approach to their future career development;

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3 Another is Other Learning Experiences, which includes service learning, workplace visits and overseas experience.

4 For example the University of Manchester offers postgraduate qualifications in work-based medical education. See www.medicine.manchester.ac.uk/postgraduate/cpd/workbasedmedicaleducation/

- Lack of engagement with learning and development at work increases the likelihood of downward career drift;
- There is a strong link between working in a learning-rich work environment and willingness to engage in formal vocational education and training; and
- Having the skills to know how to learn at work is important in stimulating people to be positive about their own career development and to be positive about engaging in continuing formal vocational education and training.

2.4 Work-based learning can lead to better youth transitions

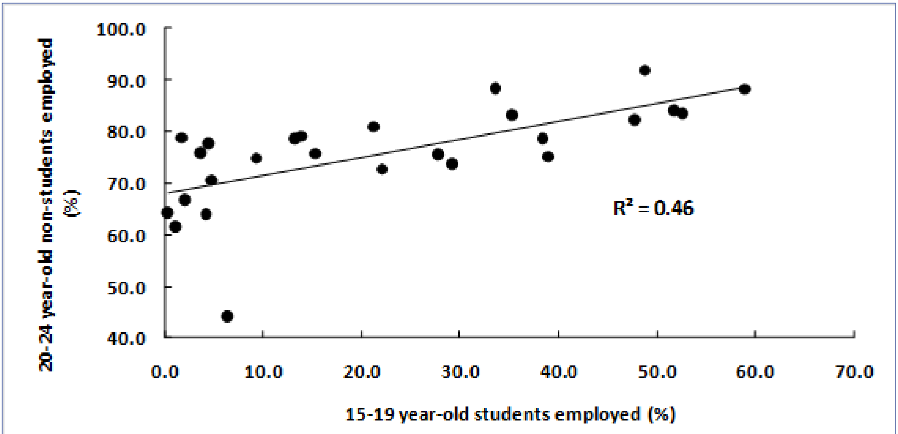
The Organisation for Economic Co-operation and Development (OECD) (2000) refers to widespread opportunities for young people to combine learning and work as one of the key features of successful transition systems. Work and formal study can be combined in a number of ways: through formal work-study programmes such as apprenticeships, cooperative education and alternance; or through students having part-time jobs after school and at weekends that do not have a formal connection to their programme of study, and where the learning that takes place is incidental to the students' formal education. For OECD countries, Figure 1 and Table 1 show that there is a strong correlation between combining work and learning, in whatever form, as a student, and the probability of finding work after leaving education. In countries where large numbers of teenagers combine learning with work, such as the Netherlands, Switzerland, Denmark, Iceland and Australia, employment rates among young adults who have left education tend to be appreciably higher than in countries such as France, Hungary, Portugal, Belgium and Italy where very few students also work, whether in apprenticeship-type arrangements or in after-school jobs. Nearly half of the variation among countries in the employment rates of 20–24-year-olds who have left education can be accounted for by rates of employment among 15–19-year-old students.

Supporting evidence is found in longitudinal studies in which employment rates among young people who worked while they studied are compared with employment rates among young people who did not. Significantly higher employment rates among those who combined work and study are generally evident, even when the

effect of other background factors is controlled for (Lucas and Lamont, 1998; Stern, 1997; Vickers et al., 2003).

The strong impact that combining work and study has upon transition outcomes is likely to be due to a number of factors. These include the occupational skills that are developed in apprenticeship programmes, and the labour market value of the qualifications that these programmes lead to;[5] the basic working habits and skills that students develop through part-time work; the signals that part-time work gives employers about young people when they apply for jobs; and the connections that are developed between individual students and individual firms that assist recruitment.

Figure 1. Percentage of 15-19 year-old students employed and percentage of 20-24 year-old non-students employed, OECD countries, 2008



Source: OECD (2010) Education at a Glance, Paris, Table C3.2a.

2.5 Work-based learning can raise the quality of vocational education and training

The arguments in favour of work-based learning within vocational education and training are largely based on the superior quality and relevance of the skills that are

5 While the balance of evidence favours the advantages of apprenticeship over either full-time vocational schooling or labour market programmes in achieving good labour market outcomes for youth, this advantage is by no means universal. Under some circumstances its value can be low: under some circumstances the value of alternatives can be high (Ryan, 1998).

developed through involvement of the learner in the production of real goods and services, arguments that receives solid support from the literature on the pedagogy of work-based learning that was outlined above. It is difficult, if not impossible, to replicate the real demands of daily production, or the cycle of production over a period of time, in a classroom or workshop, and neither can these settings easily replicate the social context of work that arises from interacting with workmates and from dealing with customers and suppliers. Workshops and classrooms cannot easily replicate the context in which skills need to be applied.

Additional arguments in favour of work-based learning within vocational education and training are that it can be a way of more closely involving employers in vocational education and training, thus increasing their confidence in the system, and of increasing the link between learners and the labour market in order to improve their chances of employment after they complete their training. There is also an economic argument for the use of work-based learning within vocational education and training, in that transferring the cost of achieving learning outcomes from publicly funded educational institutions to enterprises results in a reduction in public expenditure and a capacity to use a given level of funds more effectively to achieve wider participation in education and training. And learning that uses plant and equipment on employer premises not only results in it being more up to date with current industry practices, thus leading to skills with greater relevance, but also reduces the cost to the public purse that would result if educational institutions had to purchase the equipment.

Work-based learning can take many forms within vocational education and training. At one extreme are informal apprenticeship-type arrangements, which involve no complementary classroom-based or institutional learning, in which there is no formalized curriculum or set of required outcomes for the learning that occurs in the workplace, and which result in no recognized occupational qualification, but which nevertheless are a well-recognized method of skill formation that remains important as a source of skills in many developing economies. They are discussed further in Section 3.4.

At the other extreme are highly formalized and well-known apprenticeship arrangements such as those found in Switzerland, Germany, Denmark and Austria, in

which the learner has the legal status of a paid employee rather than of an unpaid student, required learning outcomes over the period of the apprenticeship are divided between the workplace and an educational institution, the learning that takes place in the workplace is highly structured and formally assessed, a formal contract of employment and training exists between the employer and the apprentice, the award of a recognized qualification at the end of the apprenticeship depends upon successfully meeting the learning requirements of both the workplace and the educational institution, and employer and employee organizations play a major role in managing the system and in its quality assurance (Smith, 2010).

Between these two extremes there are a number of variants. On the one hand there are arrangements such as alternance programmes in the French tradition and structured work placements that are used within Sweden's upper secondary school vocational programmes. In these the learner is legally a student rather than an employee, and hence the time in the workplace is unpaid. However as in apprenticeships the learner's time alternates between the educational institution and the workplace,[6] and the time in the workplace forms part of the formal curriculum, with agreed learning outcomes needing to be achieved by the student, and the assessment of these forming part of the requirements for the awarding of a recognized vocational qualification.

Train and place programmes are another model. In these, a period of institutional training precedes a period of employment, without the two alternating. This type of arrangement is the most common model used in China's upper secondary vocational schools (Zhao, 2011). And it is used within Norway's 2+2 apprenticeship programmes, with only the later on-the-job part of the programme being covered by a training contract (Kuczera et al., 2008).

There are also less formalized arrangements such as internships and the cooperative education programmes that are common in North America, in which students are required to spend time in a workplace as part of their programme, but in which there might be a minimal relationship between the nature of the workplace and the content of the student's course, with no formal contractual relationship, the formal

[6] Although typically with the greater proportion of the total time spent in the educational institution, unlike apprenticeships where the greater proportion of the time is typically spent in the enterprise.

teaching and learning requirements of the time spent in the workplace can be either minimal or non-existent, and any learning that does occur is not assessed (Stern et al., 1997).

The different forms of workplace learning and experience differ in the demands that they make on the firm, and in the distribution of costs and benefits between the firm and the learner. At one extreme are programmes that involve quite short periods in the workplace, which focus more upon generic employability skills. At the other extreme are programmes such as apprenticeships in which the young person is carefully recruited by the firm and spends an extended period in the firm, and in which the skills taught expand beyond general employability to encompass those that are specific to the occupation, the industry and the firm itself. In the first case the capacity of the firm to capture benefits from the programme will be minimal, and altruism and a sense of community responsibility are more likely to be the major reasons for participation (Bailey et al., 1999). As programmes move along the scale towards the second extreme, the capacity of the firm to capture benefits will increase. As these benefits increase, employer participation is more likely to be a function of the amount of productivity contributed by the young person in relation to training costs, and the benefits to the firm of being able to recruit the young person at the end of the programme (OECD, 2000).

3 Making work-based learning work

3.1 Work-based learning and levels of national economic and social development

Most of the literature on work-based learning comes from developed (OECD) economies rather than from the developing world; and most of the well-known models that connect work-based learning to formal vocational education and training such as apprenticeship, alternance and the recognition of prior learning,

have their origins in developed economies. An obvious question is whether an advanced stage of economic and social development and a high-skills economy are necessary for the existence of well-organized systems of work-based learning connecting vocational education and training systems to enterprises. The most likely answer is that, within limits, both opportunities and constraints are more a function of the nature and quality of the institutional arrangements that connect vocational education and enterprises, of culture and of politics, than they are of the stage of a country's economic and social development.

There are many examples of highly developed economies that have quite weak formal systems of work-based learning; there are many developing economies, particularly middle-income economies, where such systems are quite strong; and in many highly developed economies well-organized arrangements for work-based learning can be found in relatively low-skilled occupations and industries.

Among OECD economies, large and well-developed apprenticeship systems that account for the majority of each cohort of youth exist only in Switzerland and Germany, and apprenticeship systems that account for between a quarter and a half of youth exist only in Austria, Denmark, Norway and the Netherlands. In countries such as France and Sweden, unpaid alternance-type arrangements account for a reasonably large proportion of youth, and in Australia, Ireland and the United Kingdom there are small to medium-sized apprenticeship arrangements for youth. OECD countries that largely lack apprenticeship-type arrangements for youth include Canada and the United States; Chile and Mexico; Israel; Japan and Korea; the Czech Republic, Hungary and Poland; and Italy, Portugal and Spain (OECD, 2000; Sweet, 2009, 2010).

In the OECD's 2006 PISA survey, school principals were asked 'In your school, about how many (15 year-old) students ... receive some training within local businesses as part of school activities during the normal school year (e.g. apprenticeships)?' On average, over the forty-nine countries that responded, only 17 per cent said that more than half of 15-year-old students received training in local businesses (Table 2). Of the forty-nine countries, twenty-nine are classified as very high on the 2010 United Nations Development Programme (UNDP) Human Development Index (HDI), seventeen as high, and three as medium. While all of the countries in which high

proportions of 15-year-olds were reported to receive training in local businesses (Finland, Denmark, the United Kingdom, Sweden and Germany) are classified as highly developed, there were also many highly developed economies where it is almost unknown for students to receive such training (Hong Kong, Qatar, Portugal, Hungary and Ireland). And in one of the three medium HDI countries (Thailand), the proportion of 15-year-olds trained in local businesses exceeded the proportion in nineteen of the twenty-nine highly developed economies (OECD, 2006; UNDP, n.d.).

Table 2. School principals reporting that half or more of 15 year-olds receive training with local businesses, 2006 (%)

Very high HDI countries	Per cent	High HDI countries	Per cent	Medium HDI countries	Per cent
Finland	96	Croatia	42	Thailand	15
Denmark	87	Russia	21	Indonesia	7
United Kingdom	85	Romania	18	Kyrgyzstan	2
Sweden	79	Montenegro	16		
Germany	77	Serbia	14		
Austria	42	Bulgaria	10		
Netherlands	37	Azerbaijan	9		
Switzerland	18	Jordan	8		
Norway	16	Colombia	5		
Slovak Republic	15	Argentina	5		
Czech Republic	14	Turkey	4		
Luxembourg	12	Mexico	4		
Iceland	11	Brazil	4		
Slovenia	10	Chile	2		
Australia	9	Uruguay	1		
Canada	6	Latvia	0		
Japan	5	Lithuania	0		
Italy	5				
Israel	4				
Belgium	3				
Korea	3				

United States	2				
New Zealand	2				
Estonia	1				
Ireland	1				
Hungary	1				
Portugal	1				
Qatar	1				
Hong Kong	0				

Sources: OECD PISA database and UNDP.

In many highly developed economies, apprenticeship-type arrangements can be found associated with relatively low-skilled occupations. For example in the United Kingdom, two-thirds of all apprenticeships in 2009–10 were only at Level 2 of the national qualifications framework (NQF), and were in relatively low-skilled occupations and industries such as customer service, retailing and hospitality (Marsh, 2011). In Australia in 2009 13per cent of all apprenticeships were at the two lowest levels of the NQF, and 22 per cent were in either sales work or labouring (NCVER, 2009). In the German dual system, sales occupations have for many years been among the largest apprenticeship categories (BIBB, 2011).

Many examples, some long-standing, can be found of well-organized apprenticeship-type arrangements in countries that do not have high levels of gross domestic product (GDP). The examples below are drawn from the Middle East and North Africa, and from the Asia-Pacific region.

The Middle East and North Africa

In **Algeria** there is a long tradition of apprenticeship, with a legislative basis that stems from the 1970s and well-developed systems for financing apprenticeship through an apprenticeship tax and a national apprenticeship development fund. Apprenticeships are available in over 300 classifications and at five levels of qualification, ranging from semi-skilled to advanced technician. Apprenticeships represent over 40 per cent of all vocational education places for young people, and the government has an ambitious goal of increasing this to 70 per cent, with a corresponding reduction in full-time vocational school places.

In **Egypt** apprenticeship remains small, representing perhaps 2 per cent of secondary vocational and technical education students, but modern forms of apprenticeship date back to the 1950s.

In **Morocco** regulated apprenticeships were established in the 1940s, were strengthened in the 1990s, are available in over 120 trades, and represent an important government strategy for addressing youth unemployment, with an ambitious goal of more than doubling the number of apprenticeship places by 2015.

In **Tunisia** apprenticeship and alternance have had a legislative basis since the late 1950s. Reformed apprenticeship programmes in which one day a week is spent in a training centre and the remaining days in the workplace represent around 11 per cent of all vocational training places for young people, and alternance programmes, which are offered from craft to technician level, represent around 75 per cent of vocational education participants.

In **Turkey** enterprise-based practical training is a formal requirement for all vocational school students (who represent around 37 per cent of all secondary school students), and is organized on the basis of three days of enterprise placements and two days of classroom training each week. Formal apprenticeship programmes were introduced as a way of obtaining a vocational qualification through 1977 legislation, and currently cover 36 occupational fields and 131 branches (Sweet, 2009).

The Asia-Pacific region

In **Fiji** apprenticeships are administered by the National Apprenticeship Training Department of the Training and Productivity Authority of Fiji (TPAF). The National Apprenticeship Training Advisory Committee governs the apprenticeship system, and sets the standards for training. Apprentices are indentured under a form of contract conforming to an Apprenticeship Order under the TPAF Act 20. The contract is between the employer, the apprentice, and the director general of TPAF, and apprenticeships last from between three and five years. Off-the-job training as part of the apprenticeship is provided by the Fiji National University, normally on a block release basis. Trade apprenticeships are offered in 23 occupational categories and technician apprenticeships in five. The National Apprenticeship Training Department is responsible for ensuring the quality and standard of practical training in accordance

with prescribed on-the-job training guides. Inspections and consultations are carried out at least three times a year on all apprentices at the job site. Successful apprentices are awarded a Craft or Technician Certificate of Apprenticeship by TPAF, as well as an appropriate award by the Fiji National University if they have successfully completed their off-the-job training programme.[7]

In the **Philippines** the formal apprenticeship system is quite small, with only around 1,000 apprentices in 2009, but it is well developed, with a strong institutional underpinning. It is regulated by Title II of the Philippine Labour Code. Enterprises wishing to employ apprentices and institutions that provide the off-the-job training component need to be accredited; the training content is based upon national competency standards developed jointly with industry, and graduates receive a nationally recognized award under the Philippines NQF.[8]

In **Sri Lanka** the Tertiary and Vocational Education Act No. 20 of 1990 provides a legislative basis for apprenticeships, and coordination and regulation of apprenticeships is the responsibility of the National Apprentice and Industrial Training Authority. Apprenticeship training is based on training standards/training orders that are developed by sector-specific national advisory committees. While most apprenticeships are undertaken in an alternance mode in which employment periods and training periods are interspersed, some are also provided through a train-and-place model in which apprentices undertake an initial period of institution-based training followed by an on-the-job employment and training period. The Authority also organizes in-plant training of students undertaking degree- and diploma-level programmes in areas such as engineering and information technology. Regardless of the training mode, all trainees under such arrangements are expected to sign a contract of apprenticeship, and are called apprentices, irrespective of educational background. Apprenticeships in Sri Lanka have wide occupational and industry coverage (for example in the service sector and information technology as well as the traditional trades) and are available in 146 separate occupations. Apprentices who complete the training period specified in the training orders are required to sit a final

7 See Training and Productivity Authority of Fiji: www.tpaf.ac.fj and ADB (2008).

8 See Philippines Technical Education and Skills Development Authority www.tesda.gov.ph/ and World Bank (2010).

trade test that includes both trade theory and a practical assessment, and successful candidates are awarded a skill proficiency certificate.[9]

3.2 Institutional and organizational frameworks for raising quality in work-based learning

A number of organizational and institutional strategies can be adopted to help ensure that work-based learning is an attractive option for learners and for enterprises, and that time that is spent in the workplace results in learning. In apprenticeship training, the most important of these is an appropriately set training wage. If set too low, it will discourage people for applying to be trained; if set too high, it will encourage employers to use apprentices for relatively unskilled productive labour, and discourage them from spending time training them (Dionisius et al., 2008; Dustmann and Schoenberg, 2008).

It is also important for apprenticeship-type arrangements to be supported by appropriate legal and regulatory frameworks, including provision for contracts of employment and training between the apprentice and the employer. In the Middle East and North Africa, for example, the absence of such provisions is a factor preventing the scaling up of promising regional pilot programmes so that they have mass and national application (Sweet, 2009). Other institutional and organizational preconditions for effective apprenticeship systems include appropriate financing systems, qualification and certification arrangements including regulated links between occupations and qualifications, and well-established governance arrangements at the sectoral level, including institutional cooperation between employers, governments and trade unions to set the agreed learning outcomes for the on- and off-the-job components of apprenticeships and their link to training standards and qualifications, and local quality assurance arrangements for training young people within firms and for linking firms with off-the-job educational institutions (see for example Ryan, 2000).

Outside of apprenticeship arrangements, achieving effective student learning through workplace experience can be impeded by the organization of the school, by

9 See ADB (2011) and the Sri Lankan National Apprentice and Industrial Training Authority www.naita.slt.lk/.

the absence of appropriate central policies to support workplace experience, and by insufficient resources for programme monitoring and quality control. Box 1 illustrates these using the experience of the United States during the mid to late 1990s. A recent review in Chile (Kis and Field, 2009) has shown that in many cases these types of organizational factor act as an impediment to effective work-based learning in upper secondary vocational education programmes. In Chile, vocational education students receive a secondary school leaving certificate after four years of study. However they must complete between 480 and 960 hours of workplace training to receive a vocational certificate. Typically, this takes place after students graduate from high school, with only a very small proportion of students alternating periods in the workplace with classroom study. And so work-based learning is not integrated into the curriculum, but is seen as an application of what was previously learned in the classroom. Because completing the workplace training means that students have to delay entry to tertiary education by a year, perhaps half do not complete it. And as supervising the work-based learning is not part of teachers' normal work load, but must be done as an additional duty, teacher visits to workplaces to check the quality of the training are limited. Practical tools such as training plans that can help the firms to train students are often absent.

Box 1: Work-based learning in the United States and the 1994 School to Work Opportunities Act

The 1994 School to Work Opportunities Act in the United States provided funding of close to US$1 billion to improve school to work outcomes, including through the introduction and expansion of youth apprenticeships linked to high schools and through closer employer involvement in providing work-based learning opportunities for high-school students. Experience showed that achieving effective student learning through workplace experience was often impeded by the organization of the school, by the absence of appropriate central policies to support workplace experience, and by insufficient resources for programme monitoring and quality control. Much of the workplace experience that occurred took place only out of normal school hours (on weekends, during vacation periods and in the evenings after

school). It let students observe and experience work for very short periods, often as little as one day or half a day at a time. Extended and carefully structured involvement with work that allowed experience to be translated into learning was much rarer. The main reasons for this were the rigidity of high schools' timetables, a fear that students would miss out on 'real' (in other words, classroom) learning if they were not in school, and resistance by teachers and other key personnel in schools such as counsellors.

Source: OECD (1999).

Many similar challenges can currently be observed in China. The relatively underdeveloped apprenticeship system that had existed since the late 1950s was abandoned during the Cultural Revolution, and a 1985 decision of the Central Committee of the Communist Party effectively side-lined it by laying down the principle that training should precede employment (Guo and Lamb, 2010). Since then the dominant paradigm in upper-secondary-level vocational education in China has been the train and place model, in which one to two years of work placement in an enterprise follow two years that are spent in a vocational school (Han, 2009; Zhao, 2011).

Improving arrangements for schools and enterprises to cooperate, and extending and improving the quality of the work-based components of vocational education, are high priorities for China's vocational education and training policy makers (Zhao, 2011): they are prominent in China's 2010–2020 National Plan for Medium and Long-term Education Reform and Development (Government of China, 2010). While the central government has adopted a number of policies to support these goals, practical legal and administrative frameworks to support them, particularly at the regional level, are often lacking. At the national level a school–enterprise cooperation mechanism has yet to be established, and a wide range of separate projects and administrative measures have been adopted at the regional level and by industry sectors. Industry sector organizations remain underdeveloped, and this has impeded the introduction of more effective school–enterprise cooperation. The first regional law to promote school–enterprise cooperation was adopted by the city of Ninbo only as recently as 2008. Many models are currently being experimented

with, but quality assurance remains a significant challenge (Ho, 2011; Kuczera and Field, 2010).

3.3 Pedagogical options for achieving quality in work-based learning

Dewey (1938) pointed out that not all experience is educative, and by implication not all workplace experience results in learning. And so a key challenge for improving the quality of work-based learning is to find practical methods of translating experience into learning. For example case studies by Stasz and Kaganoff (1997) of high-school programmes in the United States that involved work-based learning showed that they varied widely in the amount of real student learning that took place. This variation was largely influenced by the quantity and nature of the targeted training provided within the firm, and in turn this was a function of the way that programmes were organized.

Within the workplace there many ways to increase the extent to which work is learning-rich. Many of these techniques are by now well understood from the theory of and research on work-based learning. They include encouraging people to reflect on their experience; guidance by other workers and by experts; using mentors; demonstration and practice; simulation; task rotation and task variety; project work; and providing workers with problems to be solved (Billett, 2001; Boud et al., 1985; Dehnbostel, 2008a). Some of these techniques can fairly readily be integrated with the normal cycle of work and production. Crucial to many is the role of workplace supervisors, and their realization that developing the knowledge, skills and expertise of workers is part of their normal job (Dehnbostel, 2008a). Where this is not part of the workplace culture, developing work-based learning can prove difficult: this was, for example, a significant barrier to attempts to develop an apprenticeship system in Korea in the 1980s (Jeong, 1995). Other techniques to develop learning-rich workplaces such as quality circles (Eliasson and Ryan, 1987) and learning islands (Dehnbostel, 2008b) require a more structured intervention.

Many of the methods that can promote and improve the quality of work-based learning can be initiated by enterprises themselves, but this is often harder for small

and medium-sized enterprises. In these cases the assistance of external organizations can be very valuable. Such assistance can take the form of coaching and training for in-firm supervisors, and the development of simple competency lists and learning guides. In the dual systems in German-speaking countries, for example, employers' chambers provide practical assistance to firms to help them develop training plans for apprentices. In the Netherlands, regional centres of expertise are responsible for coaching the in-company mentors who train apprentices (Heida, 2007). In Norway, local training offices, funded by the pooling of government training subsidies to small and medium-sized enterprises, play a similar role (Michelsen and Host, 2002). With appropriate working conditions and industrial agreements, many of these roles are able to be performed by teachers in vocational schools and colleges, particularly when they are responsible for visiting and supervising students who are on work placements.

The opportunity to learn at work is highly dependent on the day-to-day scheduling of normal work tasks and the cycle of production over the day, week and year. Where the nature of an enterprise's products and services limits the opportunities to develop knowledge and skills that are part of a formal training curriculum, cooperative arrangements between enterprises, or between enterprises and other learning venues, can be put in place to ensure that broad-based learning takes place. The regional centres in the Netherlands and in Norway referred to above are an example of such mechanisms, allowing apprentices whose employer cannot provide particular forms of experience to spend time in other firms to compensate. The inter-firm training centres that are commonly found as part of the German dual system (Walden, 2008) are another example, although in these cases training in workshops or similar venues is often used as a substitute for work-based learning.

3.4 Recognizing informal learning

In much of the developing world, informal unregulated apprenticeships in which all of the learning is work-based, there is no requirement for associated off-the-job training to be undertaken, and the acquisition of competence is not recognized through the award of formal qualifications, are the dominant mode of skill formation

for many occupations. This model continues to be important in much of the Middle East and in sub-Saharan Africa. The economic importance of such informal work-based learning should not be dismissed lightly. For example the Asian Development Bank (2004) points out that in Pakistan the traditional informal apprenticeship system known as ustad shagird remains an important source of skills. At the time Pakistan was the world's largest exporter of surgical instruments, and the industry was underpinned by an elaborate system of subcontracting among large and small enterprises. These possessed a pool of skills and metal-working knowledge based on a system of skill diffusion through informal apprenticeship, with the ustad or master craftsman transferring skills to young apprentices. And in Kenya the informal sector is reported to be the preferred destination for automotive repair and maintenance for 90 per cent of vehicle owners (Rukariah, 2011).

In a study of informal apprenticeships in Malawi, Aggarwal et al. (2010) point out that many employers, particularly those in the informal sector and in smaller enterprises, regard the skills of graduates of the informal apprenticeship system as being higher than those of graduates from the formal vocational education system, largely because of their superior practical skills, and that the employment rates for graduates of informal apprenticeships are high. However a study of informal apprenticeship in Tanzania (Nübler et al., 2009) has found that average income is higher for skilled workers whose informal apprenticeship was combined with formal or non-formal training, than for workers with only informal apprenticeship.

Nor should the training methods used in informal apprenticeships be dismissed lightly. The study of informal apprenticeships in Tanzania by Nübler et al. (2009) shows that the methods used in enterprises match much of what is known about good practice in work-based learning: demonstration, observation, practice and feedback, underpinned by a training plan and competence standards, even if both are unwritten. The authors point out that informal quality assurance mechanisms exist based upon the local reputation of master craftspeople, and that this helps to ensure that apprentices are attracted to reputable master craftspeople and discouraged from applying to employers with poor reputations as trainers and as skilled workers.

Supplementing informal apprenticeship training with training off the job, even if this is not in a formal contractual relationship, can be an important way to improve

its quality. So can assessment and recognition of the skills acquired through informal apprenticeship, so that they can better be linked into the formal vocational qualifications system, allowing for greater skills portability and for better career advancement (de Largentaye, 2009). A number of examples exist of formal trade testing and skill recognition systems that permit such a link to be made between informal apprenticeships and formal TVET.

- In **Fiji** the TPAF has a Trade Testing Department that is responsible for establishing national occupational skills standards for certification in all the important trades. The occupational skill standards were originally set up through International Labour Organization (ILO)/UNDP programmes in 1977, and are periodically reviewed to ensure that they are up to date with current practices and technological developments. This is done in consultation with representatives of employers, trade unions and relevant government bodies. The standards are used as the basis of trade tests that are conducted both for individuals and for enterprises, and on the basis of which trade test certificates are awarded that confer formal recognition as a tradesperson in Fiji. Trade test certificates are awarded at three levels: Class III, junior tradesman; Class II, qualified tradesman; and Class I, advanced or supervisor. To sit for the Class III certificate, candidates must have had a minimum of two years' full-time relevant work experience in the industry. Candidates for the Class II certificate must have had both a minimum of four years' full-time relevant work experience in the industry and attained a TPAF Class III trade test certificate (see www.tpaf.ac.fj/index.php and ADB, 2008).
- In **Korea** the awarding of National Technical Qualifications (NTQs), the country's principal vocational qualifications, is based on a highly developed national assessment and certification system which carries no requirement for completion of a course of education and training. Technical qualifications are available at five levels ranging from craftsman to professional engineer, although three-quarters of all qualifications are awarded the lowest level. Although candidates can help to prepare for the tests upon which qualifications are awarded by taking courses offered by a very wide range of public and private organizations, the curriculum of the main vocational qualifications offered by upper secondary vocational schools and junior colleges is generally not

aligned to the requirements of the NTQs. Qualifications are generally awarded as the result of passing a written and practical examination or test, but for all except the lowest level there are additional requirements before being able to apply for assessment, most commonly associated with a specified period of work experience. The content that underpins the tests is based upon national competency standards, and these are regularly updated. The certification tests are standardized across the country; are independently conducted according to clearly prescribed conditions, with registered testing supervisors; and the criteria for passing them are standardized and transparent. HRD Korea, the Korea Chamber of Commerce and Industry, and the Korea Institute of Nuclear Safety are delegated to develop and conduct the tests, which are supervised by the Ministry of Labour (HRD Korea, 2009; Kang, 2002; Kim, 2005; Nah et al., 2011).

- In the **Philippine**s there is a well-established although relatively small apprenticeship system which was first introduced in the mid-1980s. Alongside it there is a national skill assessment and certification system for middle-level occupations which is based on agreed national competency standards, and which allows for the formal recognition of informally acquired competence. Assessments are carried out by a national network of registered assessors in accredited assessment centres, and can lead to a nationally recognized vocational qualification. The web site of the Philippines Technical Education and Skills Development Authority maintains registries of accredited assessors, accredited assessment centres, and certified workers (see www.tesda.gov.ph/ and World Bank, (2010).
- **South Africa's** Skills Development Amendment Act No. 3166 of 2008 provides for artisan status to be granted to those who have successfully completed trade tests undertaken by an accredited trade test centre. It also provides for trade certificates to be granted through completion of a relevant learnership, satisfying the requirements of a relevant apprenticeship, certification of prior learning, and the completion of any other learning programme (this includes prescribed work experience) (Republic of South Africa, 2008).

- In **Sri Lanka** a national trade testing programme tests and certifies the skills of craftspeople who have gained their skills through informal means. The programme was initiated in 1984 with funding from the World Bank, initially in the construction industry, which continues to account for around 80 per cent of candidates. The Sri Lankan National Apprentice and Industrial Training Authority (NAITA) has a legal mandate to operate the programme, and it maintains the standards that are the basis of the testing. To date national trade tests have been developed for about fifty-three trades. Anyone with at least one year's experience in the chosen trade can apply to sit a trade test. Tests are conducted at four levels: Grade 3, semi-skilled; Grade 2, skilled; Grade 1, highly skilled; and certificate of competency. No formal training is required, no paper qualifications are required, and there is no age limit for applicants. In addition to conducting tests, the NAITA conducts bridging courses to allow workers to upgrade their skills prior to taking a test (see www.naita.slt.lk/Ntt.html and ADB, 2011).

These examples point to some key institutional requirements for effective arrangements to link informal work-based learning to the formal assessment and certification of competence. They include the existence of agreed occupational competency standards, a legislative or regulatory mandate for assessment and certification, mechanisms for the accreditation of assessors and/or assessment centres, support from employer groups and trade unions and the availability of opportunities for individuals to take part in skill upgrading courses prior to being assessed.

4 Conclusion

While the arguments in favour of work-based learning extend beyond vocational education and training, within vocational education and training there are a number of reasons for policy-makers and practitioners to try to introduce, extend

or improve it. First, it is a powerful form of pedagogy that can be used to develop basic work habits, occupational identity and specific occupational competences. It can motivate disadvantaged, disengaged and failing students, develop generic skills such as initiative and problem- solving, and teach entrepreneurship. It can improve students' labour market outcomes through the links that it creates between them and employers, which in turn assist recruitment, as well as through the superior quality and relevance of skills that are developed through involvement of the learner in the production of real goods and services in the workplace. The institutional arrangements that need to be put in place to support extended, high-quality work-based learning systems can be a way of more closely involving employers in vocational education and training, thus increasing their confidence in the system and raising its quality.

There are also economic arguments for the use of work-based learning within vocational education and training. Transferring the cost of achieving learning outcomes from publicly funded educational institutions to enterprises reduces public expenditure and allows a given level of funds to be used more effectively to achieve wider participation in education and training. And learning that uses plant and equipment on employer premises not only results in it being more up to date with current industry practices, thus leading to skills with greater relevance, but also reduces the cost to the public purse that would result if educational institutions had to purchase the equipment.

Work-based learning can take many forms within vocational education and training. These range from informal apprenticeship-type arrangements at one extreme to formalized apprenticeship arrangements at the other. Between these two extremes there are a number of variants. These include alternance programmes and structured work placements, in which the learner is legally a student rather than an employee, and hence the time in the workplace is unpaid. Train and place programmes, internships and cooperative education are other variations. The various forms of workplace learning and experience differ in the demands that they make upon the firm and in the distribution of costs and benefits between the firm and the learner. At one extreme are programmes that involve quite short periods in the workplace, and which focus more upon generic employability skills. At the other extreme are

programmes such as apprenticeships in which the young person is carefully recruited by the firm, and spends an extended period in the firm, and in which the skills taught expand beyond general employability to encompass those that are specific to the occupation, the industry and the firm itself. As programmes move along the scale towards the second extreme, the capacity of the firm to capture benefits from work-based learning programmes will increase.

Very few countries have large and well-developed apprenticeship systems that account for the majority of each cohort of youth. This might be taken to suggest that an advanced stage of economic and social development and a high-skills economy are necessary for the existence of well-organized systems of work-based learning connecting vocational education and training systems to enterprises. However within limits the extent and quality of work-based learning within vocational education and training systems appears to be more a function of the nature and quality of the institutional arrangements that connect vocational education and enterprises, of culture and of politics than of the stage of a country's economic and social development. There are many examples of highly developed economies such as Canada, Japan, Korea and the United States that have quite weak formal systems of work-based learning. And there are many developing economies, particularly middle-income economies, where such systems are quite strong. Examples are Turkey, Fiji and Sri Lanka.

A number of organizational and institutional strategies can help to ensure that work-based learning is an attractive option for learners and for enterprises, and that time that is spent in the workplace results in learning. Within apprenticeship training these include an appropriately set training wage, appropriate legal and regulatory frameworks, financing systems, qualification and certification arrangements including regulated links between occupations and qualifications, well-established governance arrangements at the sectoral level, and local quality assurance arrangements. Outside of apprenticeship arrangements, effective student learning through workplace experience requires supportive organizational arrangements within the school (for example timetables, teacher working conditions), appropriate central policies to support workplace experience, and sufficient resources for programme monitoring and quality control.

Practical methods to help increase the extent to which work is learning-rich include encouraging people to reflect upon their experience, guidance by other workers and by experts, using mentors, demonstration and practice, simulation, task rotation and task variety, project work, and providing workers with problems to be solved. Workplace supervisors who understand that developing the knowledge, skills and expertise of workers is part of their normal job are crucial to many of these techniques.

Introducing and using such techniques can be more difficult for small and medium-sized enterprises than for large enterprises. In these cases the assistance of external organizations such as can be found in the Netherlands and Norway can be very valuable. Such assistance can take the form of coaching and training for in-firm supervisors, and the development of simple competency lists and learning guides. In addition, cooperative arrangements between enterprises, or between enterprises and other learning venues, can be put in place to help improve the quality of work-based learning. With appropriate working conditions and industrial agreements, many of these roles are able to be performed by teachers in vocational schools and colleges, particularly when they are responsible for visiting and supervising students who are on work placements.

Where informal apprenticeships are a significant part of a country's skill formation arrangements, there are some key institutional requirements for effective arrangements to link informal work-based learning to the formal assessment and certification of competence. These include the existence of agreed occupational competency standards, a legislative or regulatory mandate for assessment and certification, mechanisms for the accreditation of assessors and/or assessment centres, support from employer groups and trade unions, and the availability of opportunities for individuals to take part in skill-upgrading courses prior to being assessed.

Acronyms and abbreviations

GDP	gross domestic product
HDI	Human Development Index
ILO	International Labour Organization
NAITA	National Apprentice and Industrial Training Authority (Sri Lanka)
NCRVE	National Centre for Research in Vocational Education (USA)
NCVER	National Centre for Vocational Education Research (Australia)
NIESR	National Institute of Economic and Social Research (UK)
NQF	national qualifications framework
NTQ	national technical qualifications
OECD	Organisation for Economic Co-operation and Development
TPAF	Training and Productivity Authority of Fiji
UNDP	United Nations Development Programme

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